A systematic review of social distancing measures impact on vulnerable populations

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Panel T7P13. POLICY EVALUATION AND POLICY ANALYSIS: RE-BRIDGING THE GAP TO EVALUATE POLICIES IN A PERIOD CHARACTERISED BY THE SARS-COV-2 PANDEMIC

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Abstract – Covid-19 has spread globally, with cases rising daily at an unprecedented rate. Governments have resorted to strict measures to contain the virus, mainly through social distancing, to curb people-to-people transmission with varying degrees of success. To date, a systematic review of social distancing measures' impact on vulnerable populations is yet to be undertaken. Following a systematic review approach, this study examines the negative/disproportionate impacts of social distancing on vulnerable populations and the ringfence measures to reduce those unintended consequences. The literature search from ten academic databases generated 31,827 records, and 12,541 records remained after removing duplicates. After data screening, 100 studies were eventually included for this review analysis. Findings show that 1) social distancing negatively affects mental health of the elderly people; 2) school closures lead to concerns about children's learning loss and decreased social interactions with peers, especially for children in low-income families; 3) low-income population and migrant workers commonly face job loss, and incurred financial challenges; 4) people with disabilities face challenges of reduction of family cohesion and reduced access to

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healthcare support; Comparatively, there are fewer studies on prisoners, disabilities, sex workers, and domestic violence than other vulnerable groups. This study has significant policy implications for controlling Covid-19 transmission and preparing for future pandemic outbreaks by systematically consolidating studies on social distancing's impact on the most vulnerable in the societies and suggesting a comprehensive social distancing package to incorporate solutions to protect the vulnerable groups from social, economic, mental and healthcare aspects.

1 Introduction

A global pandemic crisis and social distancing measures

Covid-19, a global pandemic crisis has led to around 171.5 million cases and 3.7 million fatalities accumulatively by 3rd June 2021, with the United States (US), India, Brazil, United Kingdom (UK), and Italy being some of the hardest hit countries with the highest death tolls in the world. [1] While more and more people get access to vaccines, the recent Covid-19 resurgence in India, which led to 116.1k fatalities in May 2021, is a stark reminder that the global fight against Covid-19 is far from over.

With the number of Covid-19 cases and fatalities worldwide still escalating, governments have deployed various policy instruments to bring the pandemic under control and to reduce its impact on the socio-economic systems. One widely implemented tool in governments' arsenal to curb the spread of Covid-19 is the deployment of social distancing measures. According to the World Health Organisation (WHO), social distancing aims to

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[1] Data can be found at the website of John Hopkins Coronavirus Research Centre. URL: https://coronavirus.jhu.edu/map.html

"ensure safe physical distancing through reduced crowding" (WHO, 2020, p.3). Social distancing measures range from lockdowns, school closures, to restrictions on social gatherings at homes and public places (see Table 1). For instance, most countries in the world have, at various stages of the pandemic, implemented strong policy measures like lockdowns or stay-at-home /shelter-in-place orders to curb the Covid-19 transmission; these include China (Yang et al., 2021), India (Agoramoorthy and Hsu, 2021), US (Djulbegovic et al., 2020), UK (Topriceanu et al., 2020), Italy (Coppola and Rania, 2021), and Germany (Michalowsky et al., 2021).

Table 1 Social distancing measures listed by WHO

Source	Listed social distancing measures
World Health Organization (WHO, 2020, p.3)	1. Measures for workplaces. E.g., hygiene measures, 1-2 meters distancing, work from home, measures for business continuity and minimum services, protection for front-line workers and service personnel, and closing non-essential businesses. 2. Measures for schools. E.g., hygiene measures, 1-2 meters distancing, remote learning, rotation in attendance, suspension of classes, and school closing. 3. Measures for mass gatherings. E.g., Risk assessment for high visibility events, postpone or cancel public and private events, and limiting the size of public and private events. 4. Measures for public spaces and transportation E.g., Wearing masks in public, 1-2 meters distancing in queues and waiting areas, reducing crowding or limiting access to public spaces, and closing public spaces such as entertainment venues.

Vulnerable populations under Covid-19

Even though policy measures to combat Covid-19 are implemented with deliberate calculations from the governments with a utilitarian intention to break the virus transmission chain to bring the pandemic under control, there are costs involved which may result in unintended consequences. The nature of some of these measures, such as nationwide

lockdown, can be draconian and pose negative repercussions, especially to the vulnerable populations. Although there is not a uniform definition, vulnerable populations commonly refer to social groups exposed to increased risks or susceptibility to adverse health outcomes or risks of diminished quality of life (Flaskerud and Winslow, 1998). In a pandemic (Vaughan and Tinker, 2009), sources of vulnerability include "the likelihood of exposure, of contracting the disease if exposed, and of timely and effective response or treatment" (Vaughan and Tinker, 2009, p.324). Under Covid-19 pandemic, we are concerned about vulnerable populations such as elderly people, children/students, low-income people, migrant workers, prisoners, disabilities, sex workers, and domestic violence victims who may face risks of worsening socio-economic and living conditions as a result of Covid-19 and social distancing measures. First of all, the elderly population (aged 60 and above) are at risks of more severe Covid-19 clinical symptoms (WHO, 2021). While stay-at-home orders may keep them away from contracting Covid-19 infection, these policy measures can inadvertently cause decreased utilisation of hospital services by elderly people for non-Covid related medical conditions (Michalowsky et al., 2021). Second, migrant workers often lose jobs and incomes and have difficulties returning home due to lockdowns. For instance, India implemented a nationwide lockdown for over two months at a very short notice of 4 hours on 24th March 2020, leaving migrant workers stuck where they were. As a result, the migrant workers ran out of resources quickly within a few days, had no money to pay rent, and were forced to walk hundreds of miles from major urban cities to return to hometown, and some died on their way home (Agoramoorthy and Hsu, 2021; Kumar and Choudhury, 2021). Third, for children, school closures make many children, especially children from low-income families, substantially excluded from learnings and socialisation with peers (Donohue and Miller, 2020; Fantini et al., 2020; Zhao et al., 2020). When implementing social distancing measures, other vulnerable groups such as prisoners, people with disabilities, sex workers, domestic violence victims may

also face higher risks of economic losses, increased poverty, mental health issues, disruption of health services, and violence.

Research gap and questions

To protect the wellbeing of vulnerable groups, it is important to understand the unintended consequences of some of the policy responses revolving around social distancing to the Covid-19 pandemic despite their well-intended aims. Furthermore, it is also important to understand additional measures that governments have implemented to ringfence the vulnerable populations to protect them. Researchers have published several systematic reviews on the effectiveness or impacts of social distancing measures, such as Chu et al. (2020), Fricke et al. (2021), and Phuoc et al. (2020). However, a systematic effort to consolidate knowledge to understand how some of the social distancing measures targeting general populations affect vulnerable populations is lacking. Besides, there is insufficient understanding of how some of the targeted social distancing measures intended to ringfence the vulnerable populations are designed and implemented in different countries and how these measures have impacted them.

To fill the above research gaps, we conduct a systematic review to address the following research questions: 1) What are the social distancing measures or interventions implemented that disproportionally or negatively impact vulnerable populations? 2) What are the social distancing measures or interventions implemented to ringfence the vulnerable populations during the Covid-19 pandemic? 3) How are these measures designed and packaged in different jurisdictions? 4) What are the impacts of these ringfenced measures on vulnerable populations?

2 Method and data

This research employs the systematic review method. First, we searched for articles on social distancing measures from ten databases, including PubMed, Scopus, Web of Science, ProQuest, ProQuest Coronavirus Research Database, Embase, ERIC (Educational Resource Information Center) database, LITCOVID, Cochrane database of systematic reviews, and WHO's database of COVID-19 Global literature on coronavirus disease. The initial data search resulted in 31827 records, and 12541 records remained after duplicates removed.

Second, we screened the titles of the 12541 records to identify studies related to the policy process and impacts of social distancing measures. The inclusion criteria are 1) studies that are related to the policy process and impacts of social distancing measures published between November 2019 till April 2021; 2) peer-reviewed studies (empirical, conceptual and review studies), policy briefs and/or government official reports that examine various social distancing measures from the public policy and/or legal perspectives; 3) studies that employed jurisdiction (prefecture/district/city/county, state/province, single country, multi-country) as a unit of analysis; 4) studies that use quantitative, qualitative or mixed methods as research designs; 5) studies published as full-text articles in the English language. The exclusion criteria are 1) studies published before November 2019; 2) clinical studies on the Covid-19 pandemic without public policy and/or law dimensions; 3) studies that employed individual or organisation as the unit of analysis. The title screening, in the end, identified 1630 relevant articles.

Third, among the 1630 articles related to the policy process and impacts of social distancing measures, we screened both article titles and abstracts to identify studies on vulnerable groups, including the elderly people, children/students, low-income people, migrant workers, prisoners, disabilities, sex workers, and domestic violence victims. We eventually identified and included 100 studies for this systematic review. Studies on the elderly,

children/students and low-income people are the majority (see Table 2). We downloaded the 100 studies and conducted a review of the full papers. Data extraction followed a predesigned data extraction template, covering 1) basic study characteristics such as setting (i.e., country/region/city), specific vulnerable population, main research aim, main research finding, and research methodology (e.g., case study, model simulation, interrupted time-series analysis); 2) Social distancing measures that disproportionally or negatively impact vulnerable populations, and what impacts are there; 3) policy measures to ringfence vulnerable populations, and effects of these ringfence measures. For quality control, the authors conducted two rounds of data extraction practices for 20 out of the 100 papers to build a consistent understanding of the research aims and scope. After that, one of the authors extracted data from the remaining 80 papers, and the other two authors rechecked the data extraction results to ensure consistency.

Table 2 Included studies for different vulnerable populations

Vulnerable population	Number of studies	Vulnerable population	Number of studies
Elderly people/long-term care facilities	15	Children/students	51
Low-income people	17	Migrant workers	7
Prisoners	3	People with disabilities	5
Domestic violence	3	Sex workers	2

3 Findings

Figure 1 displays the data selection and screening process. Findings from analysing the 100 studies included in this review are elaborated in the following.
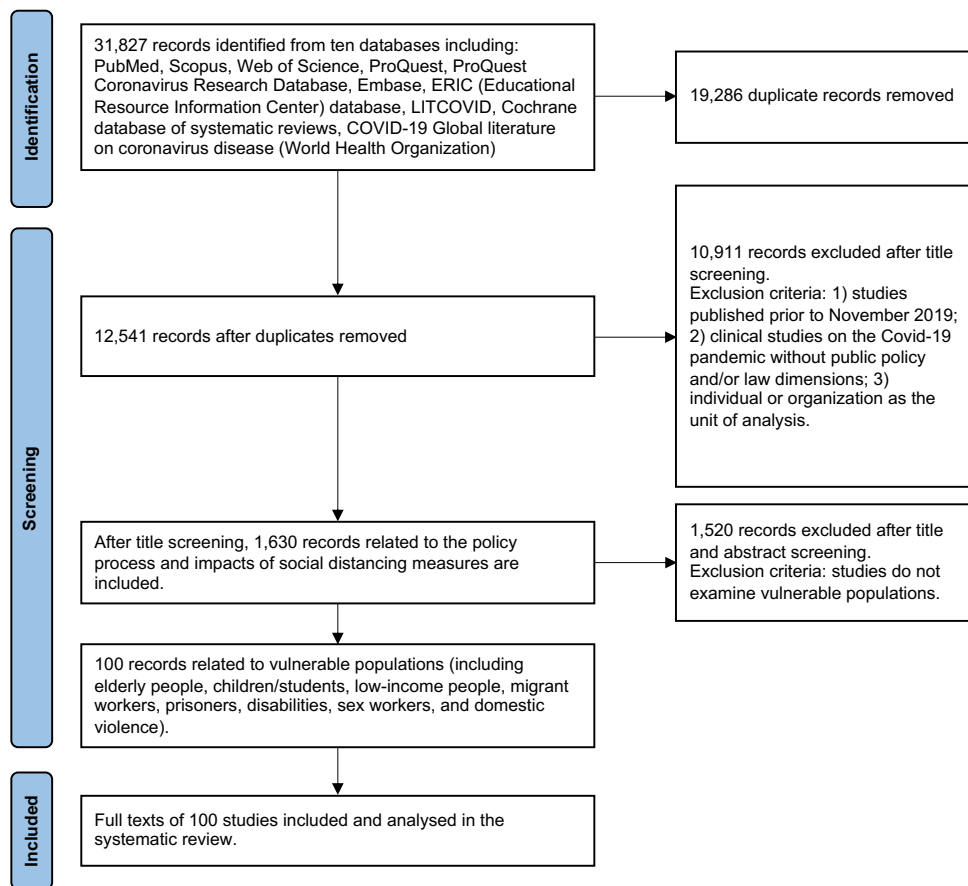
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│              │  │ 31,827 records identified from ten databases │       │                                 │
│ Identification│ │ including: PubMed, Scopus, Web of Science,   │──────▶│ 19,286 duplicate records removed │
│              │  │ ProQuest, ProQuest Coronavirus Research      │       │                                 │
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│              │  │ Information Center) database, LITCOVID,       │
│              │  │ Cochrane database of systematic reviews,     │
│              │  │ COVID-19 Global literature on coronavirus    │
│              │  │ disease (World Health Organization)          │
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Figure 1. Data collection and screening process

(1) Elderly people & social distancing

In March 2020, Brazil's President raised a "vertical isolation" policy that suggested social distancing measures would only be imposed on high-risk populations such as the elderly (Venturieri et al., 2021) to maintain the economy, which was met with strong opposition. In most countries, despite social distancing measures were neutrally applied to all populations, they may harbour negative impacts on the elderly population. Social distancing policy measures, particularly lockdowns, were reported to have negatively affected the elderly people's utilisation of hospital services (i.e., decreased physician consultations and hospital admissions for diseases other than the Covid-19) and resulted in worse mental health outcomes such as prolonged loneliness. These impacts predisposed them to greater risks of cardiovascular, autoimmune, and neurocognitive diseases. Nevertheless, the use of technology

was considered helpful to enable the elderly populations to maintain social connections with their loved ones to mitigate the loneliness and maintain their wellbeing when they were isolated at home or long-term care (LTC) facilities. For instance, in New Brunswick in Canada, the government provided one iPad for every 10 residents residing in LTC facilities to enable them to connect with family members virtually (McArthur et al., 2021). Besides, the deployment of student volunteers was found to mitigate poor mental health outcomes among the elderly population (ibid). To avoid Covid-19 outbreaks within the LTC facilities, early detection and contact tracing were found to be effective interventions (Park et al., 2020). The Korean government conducted a nationwide surveillance of 1470 LTC facilities from February to March 2020 to determine whether or not restricted visitors, identification and isolation of patients with Covid-19 symptoms, and quarantine of employees who had recently travelled to high-risk countries/regions were strictly adhered.

(2) Children/students & social distancing

Many countries imposed school closures in different periods to avoid Covid-19 outbreaks in schools. Nonetheless, school closures caused widespread concerns about children's suboptimal learning at home, their decreased social interactions with peers, and sparked concerns about the widening of the learning gaps between students from different socioeconomic statuses. Remote learning is widely conducted during school closures. It put pressures on teachers' technical capacities to operate digital teaching and often increased their working time as they navigated the new virtual space to follow up with students' learning progress and feedbacks. Research had shown that the teachers' capacity in operating digital teaching is positively associated with the students' learning task control (Huber and Helm, 2020). In addition, a virtual learning environment caused inadvertent disruptions from time to time. It was found that children in low-income families were more significantly affected by disruptions in learning and deprived of services and supports they could have received at

school. They were less likely to have access to technical resources, regular meals, and parental support when studying at home than the general student population. To support vulnerable students in low-income families, some schools in Germany, Austria, and Switzerland provided printed material to students with insufficient technical resources, such as laptops or printers (Huber and Helm, 2020). In Canada, the reopening of the schools was very much focusing on students' mental health issues and wellbeing. Priorities were given to accelerate various learning interventions and service provisions for vulnerable students to ensure their health and safety (Fitzpatrick et al., 2020). In the US, through a federal stimulus package – the Coronavirus Aid, Relief, and Economic Security (CARES) Act, the federal government approved a $13.5 billion funding for schools. CARES Act utilised the Governor's Education Relief Fund and the Elementary and Secondary School Emergency Relief Fund to allocate funds for K-12 education (i.e., from kindergarten to 12th grade). In addition to these one-time funds, governments also need to secure short-term and long-term funds for school education to improve their technical equipment and personnel resources.

(3) Low-income people & social distancing

Under social distancing measures, particularly lockdowns, low-income people face considerable challenges, including job loss (as many low-income people are daily wage earners), financial challenges, lack of access to food and personal hygiene equipment. Research studies have demonstrated that it has been extremely challenging for low-income populations to adhere strictly to various social distancing measures. In urban slums in India, residents were exposed to poor living conditions, food insecurity, a dearth of sanitation facilities, and a lack of clean drinking water; the high population density in slums rendered 1-meter or 2-meter distancing impractical. These have negative repercussions for the government in terms of tracing, testing and treating the Covid-19 disease. In a study on stay-at-home orders in the US, lower-income groups were found to have limited options of working remotely and ended up

making more work-related trips and visits to retail, grocery and pharmacies as compared to higher-income groups, resulted in them bearing a disproportionate burden of exposures to health risks (Lou et al., 2020). Economic and health care support must be provided for low-income groups. The UK government implemented the Coronavirus Job Retention Scheme to support low paid young workers in the form of a furlough payment that provides wages for workers on a temporary layoff or involuntary leave due to Covid-19 [2]. For rural populations, case detection and surveillance capacity have to be improved, and basic amenities such as internet access, drinking water, and electricity need to be made available. In China, some rural communities established their own emergency teams to manage Covid-19 issues. These citizen-led and self-organised initiative set up roadblocks to restrict traffics and persuaded people to reduce gatherings. While these measures were useful to control Covid-19 infections, they resulted in unintended consequences such as economic losses (Liu et al., 2020).

(4) Migrant workers & social distancing

Under lockdowns/stay-at-home orders, migrant workers (inter-state or inter-country) faced a variety of challenges which include job losses, incurred income losses and food insecurity, barriers to return home due to travel restrictions, high exposure risks due to overcrowded living places, lack of access to testing and the healthcare systems, and lack of access to hygiene resources. The income losses were more significantly experienced by the elderly workers who could not work during lockdowns (Guha et al., 2020). Migrant workers also suffered significant mental toll due to financial instability, loneliness, and lack of communications with their family members (Melillo, 2020). Their families may also face heightened poverty due to a reduction in the remittances sent from the migrant workers. In India, as migrant workers could not convey their needs to the government, many of them

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[2] https://www.instituteforgovernment.org.uk/sites/default/files/publications/coronavirus-job-retention-scheme_0.pdf

attempted to walk back to their villages from the cities but were arrested in various inter-state borders for violating the lockdown mandate, which started on 24th March 2020 (Guha et al., 2020). Thereafter, the Indian Government's order on 29th April 2020 announced the resumption of transport facilities such as buses and trains for migrant workers, on the condition that both the destination state government and inception state government could make a joint request to the central government to apply for the resumption of transportation (Kumar and Choudhury, 2021).

Nonetheless, the order engendered chaos due to ineffective communications between Indian states and Union territories (ibid). During the lockdown, the Indian central government and some state governments suggested employers keep paying full wages and salaries to employees. These advisories also encountered barriers because many small businesses could not afford to adhere to the advisories (ibid).

(5) Prisoners & social distancing

To reduce population density in prisons, some governments decided to release prisoners, such as in the US (Schotland, 2020) and Portugal (Fróis, 2020). However, this policy measure can also cause unintended problems. For instance, in Portugal, the decision was made in a short period without detailed considerations (Fróis, 2020)– the president promulgated the policy measure to release prisoners five days after the idea was proposed in the parliament. About 10% of the prison population were released, and they include prisoners serving sentences of under two years, to those nearing the end of their sentences, and to those aged 65 years and above with underlying health conditions. These prisoners were given only one day notice before they were released and had no means of transport to return home at a time when social distancing measures such as restrictions on public transport were already implemented. For inmates who remained in jail, no specific measures were taken to maintain social distancing

and protect them from contracting the Covid-19 infection, except distributing gloves and face masks to correctional treatment staff and prison officers (*ibid*).

(6) Physical disabilities & social distancing

Under lockdown/stay-at-home orders, reduction of family cohesion and reduced access to healthcare support were the challenges that people with disabilities have to face (Dalise et al., 2021). For students with disabilities, when schools were closed for Covid-19, lack of necessary technologies (i.e. braille readers) and services (i.e. help and support from special education teachers) at home may lead to their difficulties in remote learning participation. In the US, school districts addressed these challenges by modifying instructions and learning goals to account for the limitations of remote learning, holding virtual meetings with school officials, parents and students (when appropriate), and increasing collaborations between teachers and parents (Nowicki, 2020). Even so, families without computers were unable to attend meetings and webinars. By and large, it has been challenging for school districts to provide remote learning to students with disabilities because the services and the number of specialised instruction hours may differ for each student (ibid).

(7) Sex workers, domestic violence victims & social distancing

For sex workers, many lost their jobs or income consequent to the implementation of various social distancing (i.e. lockdown, restrictions on public transport, closure of entertainment venues) measures. More importantly, their access to testing and treatment for sexually transmitted infections was disrupted (Janyam et al., 2020). Sex workers living with HIV reported a lack of access to antiretroviral therapy (ART) access during lockdown (Janyam et al., 2020; Reza-Paul et al., 2020). In Mysore city, India, the ART access was disrupted when the city imposed a lockdown. This is because the government-run district hospital, which was previously tasked with the majority of ART distribution in the city, was designated as the only

testing and treatment centre for Covid-19 in the city at the beginning of the lockdown, which immediately halted regular ART dispensation (Reza-Paul et al., 2020). To secure the basic needs of sex workers, community-led organisations, such as Raks Thai Foundation, Dannok Health and Development Community Volunteers and SWING, provided food and personal hygiene equipment including hand sanitiser, condoms and masks in Thailand (ibid). In India, Ashodaya Samithi, a sex worker organisation based in Mysore, implemented community-driven health interventions to support sex work during the Covid-19 pandemic (Janyam et al., 2020). Considering that ART was disrupted, the organisation formed a community-led system to distribute ART at private and discreet sites and utilised WhatsApp messaging to share information related to Covid-19 (ibid).

Countries/cities such as Argentina, Bangladesh, China, France, Portland, UK, San Antonio, and New York all observed increased domestic violence reports or cases during lockdowns/stay-at-home orders (Boserup et al., 2020; Hamadani et al., 2020; Universities UK, 2020). School closures may put children who suffer from domestic violence abuse at higher risks of exposures to violence. They may also face difficulties in leaving home to reach for help during the lockdown. In the UK, due to the alarming trends in domestic violence, several national campaigns were organised to raise domestic abuse awareness and highlighted available help services, including campaigns "UK SAYS NO MORE" and "YOU ARE NOT ALONE" (Universities UK, 2020). Helpline services were extended for those experiencing domestic violence in the UK, and the government provided funds to support these helplines and other online support since April 2020 (ibid). People experiencing domestic abuse were allowed to bypass the lockdown restrictions and travelled to sheltered accommodations to seek refuge (ibid).

4 Discussion

While there is a robust scientific basis for social distancing measures, little is known about their ethical implications and socio-economic trade-offs. Social distancing measures could disproportionately impact the most vulnerable groups in society through job losses, reduction in incomes, deterioration in mental health, and widened socio-economic gaps between the richest and the poorest (Colbourn, 2020; Lewnard and Lo, 2020). The most economically disadvantaged were the least able to comply with social distancing measures, such as working from home, because they may lack a conducive home environment in the first place (Atchison et al., 2020).

This systematic review presents a comprehensive effort to consolidate empirical insights into the impacts of Covid-19 social distancing measures on the most vulnerable in the societies and determine strategies and actions that have been taken to help them. There have been review studies on social distancing measures and their effectiveness (Chu et al., 2020; Fricke et al., 2021; Phuoc et al., 2020), but few reviews focused specifically on the vulnerable groups. Hence, this systematic review bridges this research gap to inform social distancing policies and practices to mitigate unintended consequences on vulnerable groups.

Among the vulnerable groups, there were more studies on the elderly population, and children/students, while other vulnerable groups such as the prisoners, people with disabilities, sex workers, and domestic violence victims received much less attention. It is worth noting that the vulnerable groups discussed in this research are not exclusive from one another. The identities of vulnerability are highly intertwined, as some populations may belong to multiple vulnerable groups concurrently, such as children in low-income families or elderly migrant workers.

Among the countries that implemented social distancing measures, few countries have ringfence measures for the vulnerable groups (i.e. income support for the impoverished) who

suffer from unintended consequences of social distancing (Hale et al., 2021). Effective control of the pandemic requires packaging policy measures strategically to address multiple competing objectives, balance the various conflicts and tensions from controlling virus transmission to save lives, sustain the economy, and ensure that the wellbeing of the vulnerable groups is accounted for. Social distancing measures should be complemented with ringfence measures to reduce the negative/disproportionate impacts of social distancing measures on vulnerable groups. More research is required to weigh the trade-offs between the benefits and unintended negative consequences of social distancing measures, to improve their design and minimise long-term socio-economic disparities.

5 Conclusion

This research systematically reviews the social distancing impacts on vulnerable groups and ringfence policy measures to alleviate the unintended consequences. It reveals that many social distancing measures have disproportionate/negative impacts on different vulnerable populations. For the elderly population, social distancing negatively affects the elderly population's utilisation of hospital services (i.e. decreased physician consultations and hospital admissions for diseases other than the Covid-19) and resulted in worse mental health outcomes when isolated at home or LTC facilities. The use of technologies such as virtual meetings can be useful in reducing their loneliness. For children/students, school closures led to concerns about their learning disruptions and decreased social interactions with peers, especially for children in low-income families. To address this, the governments should consider allocating both long-term and short-term funds to help the schools to build remote teaching capacity. Schools should secure provisions for vulnerable children in low-income families, for instance, by redeploying staff to support learning for the vulnerable children or sending printed materials to those who do not have laptops or printers. For low-income population and migrant workers,

job loss and incurred financial challenges were the common challenges faced during lockdowns. Provisions of direct subsidies, job retention schemes, or reemployment services would help lessen these negative impacts. For migrant workers, arrangements should be made for them to return home or connect with their families virtually. To control Covid-19 virus transmission in prison settings, some states/countries released a proportion of inmates, but this hasty measure is not enough to address the dire situation of the pandemic and should be combined with other policy measures to maintain social distancing in prisons. For people with disabilities, reduction of family cohesion and reduced access to healthcare support were major problems that occurred when implementing social distancing measures. Essential healthcare services should be made available even during lockdowns. For sex workers, they often experienced income loss and lack of access to testing and treatment for sexually transmitted infections. Thus, community-led organisations or nongovernmental organisations play critical roles in offering sex workers food, hygiene equipment, and essential healthcare services. For domestic violence victims, many countries reported increased domestic violence under lockdown/stay-at-home orders. Public information campaigns can be organised to raise awareness, and those suffering from domestic abuse should be allowed to bypass the stringent lockdown rules to seek help.

In this systematic review, we found more discussions about problems than solutions to address the needs of the vulnerable groups when imposing social distancing policy measures to control Covid-19. More actions need to be taken to protect vulnerable populations. Governments need to design more comprehensive and holistic policy packages of social distancing that incorporate social, economic, mental and physical health solutions to protect vulnerable groups.

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